

REMARKS

Claims 1-12 and 14 are pending.

Claims 1-10 and 14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Tani et al. (JP 10-231317) in view of Badley et al. (US 5,576,263).

Claims 1-6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Koehn et al. (Abstr. ACS, 1997) in view of Badley et al. (US 5,576,263). Applicants respectfully traverse these rejections.

Applicants again urge that it would not have been obvious to use the complex of the claims to catalyze the *copolymerization* of olefinically unsaturated compounds. The Examiner argues that the notion of copolymerization of olefins is not novel and that Badley et al. discusses copolymerization using chromium catalysts. Nonetheless, the present invention exhibits the unexpected result of only minimal change of density when comparing homopolymerization with copolymerization (see specification Table 5, Examples 53 and 54. Applicants enclose Abb. (Fig.) 13, *Ullmann*, 4th Ed., Vol. 19, p. 187 (which was apparently not received with the previous response) evidencing that one of ordinary skill in the art would have expected that density is generally significantly reduced when comonomer is incorporated. Such evidence of unexpected results must be considered. MPEP 2141.

Applicants further urge that it would not have been obvious to employ the complex in conjunction with a support (claim 9). Applicants enclose the journal article apparently omitted from the previous response and request consideration thereof.

Additionally, the Examiner previously indicated that claim 8 would be allowable if

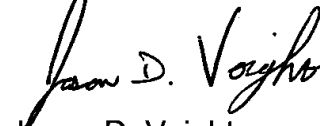
✓ out type

rewritten in independent form. If this is no longer the case, applicants request some explanation. Applicants similarly request an explanation regarding the rejection claim 14, which was not specifically addressed in the Office action.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees to Deposit Account No. 11.0345. Please credit any excess fees to such deposit account.

Respectfully submitted,

KEIL & WEINKAUF

A handwritten signature in black ink, appearing to read "Jason D. Voight", is written over the printed name.

Jason D. Voight  
Reg. No. 42,205

1350 Connecticut Avenue, N.W.  
Washington, D.C. 20036  
(202) 659-0100

Enclosures

JDV/kas

**COMPLETE LISTING OF ALL CLAIMS IN THE APPLICATION**

- 1.(previously amended) A process for copolymerizing ethylene or propylene with one another or with other olefinically unsaturated compounds, which comprises carrying out in the polymerization in the presence of a catalyst system which comprises the following components:
  - A) a complex of a transition metal with one or two substituted or unsubstituted 1,3,5-triazacyclohexane ligands and
  - B) if desired one or more activator compounds.
- 2.(previously amended) A process for copolymerizing ethylene or propylene with one another or with other olefinically unsaturated compounds at from 20 to 300°C under pressures from 5 to 4000 bar, which comprises the following steps:
  - a) contacting a complex of a transition metal with one or two substituted or unsubstituted 1,3,5-triazacyclohexane ligands (A) with at least one activator compound (B),
  - b) contacting the reaction product from step (a) with the olefinically unsaturated compounds under polymerization conditions.
- 3.(previously amended) A process as claimed in claim 1, wherein the component (A) is a compound of the formula I

in which:

M is a transition metal of groups 4 to 12 of the Periodic Table,  
R<sup>1</sup>-R<sup>9</sup> are hydrogen or organosilicon or organic substituents having from 1 to 30 C atoms, it being possible for two geminal or vicinal radicals R<sup>1</sup> to R<sup>9</sup> radicals also be connected to form a 5- or 6-membered ring, and it being

- possible, when  $m$  is 2, for an  $R^1-R^9$  radical of in each case one triazacyclohexane ring to form together with a substituents on the other triazacyclohexane ring a bridge between the two rings,
- X is fluorine, chlorine, bromine, iodine, hydrogen,  $C_1-C_{10}$ -alkyl,  $C_6-C_{15}$ -aryl or alkylaryl having from 1 to 10 C atoms in the alkyl radical and from 6 to 20 C atoms in the aryl radical, trifluoroacetate,  $BF_4^-$ ,  $PF_6^-$  or bulky noncoordinating anions,
- $m$  is 1 or 2,
- $n$  is a number from 1 to 4 which corresponds to the oxidation state of the transition metal M.
- 4.(previously amended) A process as claimed in claim 1, wherein M is a transition metal of group 6 of the Periodic Table.
- 5.(previously amended) A process as claimed in claim 1, wherein mixtures of ethylene with  $C_3-C_8$ - $\alpha$ -olefins are employed as monomers.
- 6.(previously amended) A process as claimed in claim 1, wherein an aluminoxane is employed as activator compound (B).
- 7.(previously amended) A process as claimed in claim 1, wherein borane or borate having at least 2 substituted aryl radicals is employed as the activator compound (B).
- 8.(previously amended) A process as claimed in claim 3, wherein at least one of the radicals  $R^1$ ,  $R^2$  or  $R^3$  is different from the other radicals in this group.
- 9.(previously amended) A catalyst for polymerizing olefins, comprising at least one transition metal complex (A) as defined in claim 1 and a support material and, if desired, one or more activator compounds (B).
- 10.(original) A process for polymerizing or copolymerizing olefins wherein the polymerization or copolymerization is carried out in the presence of a catalyst as claimed in claim 9.
- 11.(previously amended) A transition metal complex of the formula I

in which:

M is a transition metal of groups 4 to 12 of the Periodic Table,

R<sup>1</sup>-R<sup>9</sup> are hydrogen or organosilicon or organic substituents having from 1 to 30 C atoms, it being possible for two geminal or vicinal radicals R<sup>1</sup> to R<sup>9</sup> radicals also be connected to form a 5- or 6-membered ring, and it being possible, when m is 2, for an R<sup>1</sup>-R<sup>9</sup> radical of in each case one triazacyclohexane ring to form together with a substituents on the other triazacyclohexane ring a bridge between the two rings,

X is fluorine, chlorine, bromine, iodine, hydrogen, C<sub>1</sub>-C<sub>10</sub>-alkyl, C<sub>6</sub>-C<sub>15</sub>-aryl or alkylaryl having from 1 to 10 C atoms in the alkyl radical and from 6 to 20 C atoms in the aryl radical, trifluoroacetate, BF<sub>4</sub><sup>-</sup>, PF<sub>6</sub><sup>-</sup> or bulky noncoordinating anions,

m is 1 or 2,

n is a number from 1 to 4 which corresponds to the oxidation state of the transition metal M,

wherein at least one of the radicals R<sup>1</sup>, R<sup>2</sup> or R<sup>3</sup> is different from the other radicals in this group.

12.(previously amended) A transition metal complex of the formula I as defined in claim 11, wherein m is 2 and one radical R<sup>1</sup>-R<sup>9</sup> of one triazacyclohexane ring together with one of these substituents of the other triazacyclohexane ring forms a bridge between the two rings.

13. (canceled)

14. (previously added) A process as claimed in claim 3, wherein m is 2 and one radical R<sup>1</sup>-R<sup>9</sup> of one triazacyclohexane ring together with one of these substituents of the other triazacyclohexane ring forms a bridge between the two rings.